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EXAMINER	
TANINGCO, MARCUS H	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/550,183	**Applicant(s)** COLE ET AL.	
	Examiner MARCUS H. TANINGCO	**Art Unit** 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 4/29/09.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-5,30-44 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-5,30-44 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 9/21/05 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/29/2009 have been fully considered but they are not persuasive. Applicant's main argument is that prior art fails to specifically teach a step of differentiating a detected signal to compensate for a surrounding material. The combination of Nuss and Wallace however, teach a method and apparatus for THz imaging to identify a sample under investigation and to distinguish it from its surrounding material. In Wallace for example, a sample is investigated and the detected signal is adjusted in order to compensate for the window on which said sample is pressed against. Because the window has two interfaces on which irradiation radiation is incident upon, the detected signal may change depending on the type of window being used. Since a derivative is simply a measure of how a function changes as its input changes, taking the derivative of the detected signal to compensate for different input at various points of the sample would have been within the technical grasp of one ordinarily skilled in the art at the time of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 34, 38, 39, and 41-43 rejected under 35 U.S.C. 103(a) as being unpatentable over Nuss (US 5,623,145) in view of Wallace et al. (*Wallace*, US 2005/0082479).

With regards to claims 1, 3, 42, and 43, Nuss discloses a method and apparatus for THZ imaging wherein: an optical source generates pulsed radiation in the range of 100 Ghz to 20 Thz at an object; and a detector detects signals after propagation through said object, wherein said signals are analyzed to determine the composition of said object (column 2, lines 15-55); and wherein said apparatus is also capable of differentiating between different materials (*surrounding material*) in the object (Abstract). The method and apparatus, as disclosed by Nuss, has applications in materials inspection and packaging inspection, but lacks a specific description for use in detecting explosive materials. Nevertheless, both Nuss and the claimed invention teach methods of identifying material composition using Thz imaging techniques. As such, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Nuss since the substitution of one known element for another would have yielded predictable results. Although Nuss fails to teach adjusting the detected radiation signal to compensate for the effect of surrounding material, Wallace teaches a Thz imaging method and

apparatus wherein a baseline signal is subtracted from a detected signal in order to compensate for a surrounding material [0033-0034]. Thus, it would have been obvious to one of ordinary skill in the art to apply the technique of identifying target materials by compensating for a surrounding material for the predictable result of differentiating between different materials. Also, although the combination of Nuss and Wallace fail to specifically teach a further step of differentiating the signal of the detected radiation to compensate for the effect of the surrounding material, manipulating the data received from the detected radiation using various mathematical functions would have been within the skill of one with ordinary skill in the art at the time of the invention for various analysis techniques and is therefore seen as a matter of routine design choice.

With regards to claim 2, Nuss discloses a method and apparatus for THZ imaging wherein: an optical source generates pulsed radiation in the range of 100 Ghz to 20 Thz at an object; and a detector detects signals after propagation through said object, wherein said signals are analyzed to determine the composition of said object (column 2, lines 15-55); and wherein said apparatus is also capable of differentiating between different materials (*surrounding material*) in the object (Abstract). The method and apparatus, as disclosed by Nuss, has applications in materials inspection and packaging inspection, but lacks a specific description for use in detecting explosive materials. Nevertheless, both Nuss and the claimed invention teach methods of identifying material composition using Thz imaging techniques. As such, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Nuss since the substitution of one known element for another would have yielded predictable results. Although Nuss fails to teach a continuous source, those skilled in the art

appreciate that either pulsed laser or multiple continuous wave sources may be used and are considered art recognized equivalents and considered a matter of routine design choice. Although Nuss fails to teach adjusting the detected radiation signal to compensate for the effect of surrounding material, Wallace teaches a Thz imaging method and apparatus wherein a baseline signal is subtracted from a detected signal in order to compensate for a surrounding material [0033-0034]. Thus, it would have been obvious to one of ordinary skill in the art to apply the technique of identifying target materials by compensating for a surrounding material for the predictable result of differentiating between different materials. Also, although Nuss fails to specifically teach a further step of differentiating the signal of the detected radiation to compensate for the effect of the surrounding material, manipulating the data received from the detected radiation using various mathematical functions would have been within the skill of one with ordinary skill in the art at the time of the invention for various analysis techniques and is therefore seen as a matter of routine design choice.

With regards to claims 34, 38 and 39, Nuss discloses a method and apparatus for THZ imaging with applications in materials inspection and packaging inspection (column 2, lines 31-47), but fails to teach compensating for the member covering the object of interest by differentiating the detected radiation by obtaining the first derivative of a frequency spectrum of the detected radiation. Nevertheless, those skilled in the art appreciate that compensating for attenuation would have been obvious since the technique for improving a particular class of devices was part of the ordinary capabilities of a person of ordinary skill in the art (*KSR International Co. v. Teleflex Inc.*, 550 U.S.-,82 USPQ2d 1385 (2007)).

With regards to claim 4, Nuss discloses analyzing the detected radiation by determining a frequency spectrum from the detected radiation since certain material and objects can be characterized by a frequency-dependent absorption, dispersion, and reflection of terahertz transients in signals which pass through the material or object (column 2, lines 30-34).

With regards to claim 41, Nuss fails to specifically teach determining whether a reference beam is in phase with the detected radiation and adjusting the detected radiation. Those skilled in the art appreciate that in order to derive sensible information from a sample, there is a need to measure the change in the phase of the source beam caused by the sample. Thus, detector 2 needs to know some information about the phase of the radiation leaving the source. A way of doing this is to use a reference beam, which has a phase related to that of the source beam and which is received by the detector. Actually, many detectors of THz radiation require a reference beam in order to detect radiation received by the detector. As such, determining whether a reference beam is in phase with the detected radiation and adjusting the detected radiation is viewed as a matter of routine design choice.

Claims 5, 30-33, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuss in view of Wallace et al. (*Wallace*, US 2005/0082479) and Hartick et al. (*Hartick*, US 2001/0033636).

With regards to claims 5, 30, 31, and 44, Nuss lacks a description of obtaining a frequency spectrum at a number of predetermined frequencies. Hartick teaches a method of detecting explosives in luggage comprising: analyzing a frequency spectrum and comparing said spectrum to different explosives, wherein the measured energies can provide an indication of the

presence of an explosive, and can thereby provide information about the presence and nature of an explosive material in the object [0005]. It would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Nuss with the method taught by Hartick in order to detect explosives.

With regards to claims 32 and 33, Nuss discloses the claimed invention except for the calculation of intensity ratios. Nevertheless, manipulating the data received from the detected radiation would have been within the skill of one with ordinary skill in the art at the time of the invention for various analysis techniques and is therefore seen as a matter of routine design choice.

Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuss in view of Wallace et al. (*Wallace*, US 2005/0082479), Hartick et al. and Mickan et al. (*Mickan*, US 6,605,808).

With regards to claims 35 and 36, Nuss fails to teach a predetermined frequency corresponding to a region of low water absorption. Mickan teaches a diagnostic apparatus using Thz radiation. Mickan explains that Thz is strongly attenuated by the object under inspection because of water absorption (column 1, lines 54-57). Therefore, in order to effectively inspect an object under inspection, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify the method taught by Nuss to include analysis at a predetermined frequency corresponding to a region of low water absorption to reduce the effects of attenuation of the Thz rays.

With regards to claim 37, Nuss fails to teach reducing the resolution in the analysis of the detected radiation in order to reduce the effects of water absorption. Nevertheless, Mickan explains that Thz is strongly attenuated by the object under inspection because of water absorption (column 1, lines 54-57) and thus reducing the effects of water absorption would generally improve the conditions of the detected radiation. As such, reducing the resolution in the analysis of the detected radiation would have been obvious since the technique for improving a particular class of devices was part of the ordinary capabilities of a person of ordinary skill in the art, in view of the teaching for improvement in other situations (*KSR International Co. v. Teleflex Inc.*, 550 U.S.-,82 USPQ2d 1385 (2007)).

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nuss in view of Wallace et al. (*Wallace*, US 2005/0082479) and Miller (US Reissue 36,201).

With regards to claim 40, Nuss discloses the claimed invention except for measuring the TOF of the detected radiation to determine whether the object is an explosive material from the absorption measure. Miller teaches a detector to identify explosives using TOF techniques to determine the composition of the material (column 15, lines40-49; column 17, lines 36-64). Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify Nuss with a method including a TOF measurement in order to effectively identify explosive materials.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcus H. Taningco whose telephone number is (571) 272-1848. The examiner can normally be reached on M - F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Porta/
Supervisory Patent Examiner, Art Unit 2884

/Marcus H Taningco/
Examiner, Art Unit 2884